Public Comment Metric

Originating Office:	Document Description:	Project Lead/Reviewer	Reviewing Office:	Date of Review:
AIR-130	TSO-C63e, Airborne Weather Radar Equipment	Lee Nguyen		

	Commenter	Section # and Page #	Comment	Suggested Change and Rationale	Disposition
1.	Rockwell Collins	1.0 Purpose	The paragraph includes the sentence, "This TSO addresses forward looking windshear capability." This is misleading since the TSO also addresses weather detection, ground mapping, atmospheric threat awareness, and turbulence detection capability.	Please consider revising the text to include the full list of functions addressed by the TSO in the Purpose paragraph. At a minimum, please revise the text so as not to be misleading by omission.	Accepted. Replaced "This TSO addresses forward looking windshear capability." with: "This TSO addresses weather detection and ground mapping, forward looking windshear detection, forward looking turbulence detection, and atmospheric threat awareness capability."
2.	Rockwell Collins	Table 1	Table 1 references DO-220A paragraph 2.1.2. In the past, additional requirements from section 2.1 have been required by the FAA including paragraph 2.1.4 addressing flammability.	Please consider including paragraph 2.1.4 in Table 1. Alternatively, please include specific language excluding requirements from 2.1 other than 2.1.2.	Partially Accepted. Deleted DO-220A paragraph 2.1.2 from Table 1 since the proposed TSO-C63e paragraph 3.a, Functionality, already addresses intended function. It's not necessary to include paragraph 2.1.4, flammability, in Table 1 since the proposed TSO-C63e paragraph 3.d already addresses flammability.
3.	Garmin	1. Page 1	Section 1 includes the following statement: This TSO addresses forward looking windshear capability. It does not include flight guidance system functionality in support of an approved windshear detection and avoidance system. This statement is confusing. This statement has existed in previous revisions of the TSO, but the word "addresses" can be read to imply that the	Suggest replacing "addresses" with "includes": This TSO **includes** forward looking windshear capability. It does not include flight guidance system functionality in support of an approved windshear detection and avoidance system.	Accepted. Replaced "This TSO addresses forward looking windshear capability. It does not include flight guidance system functionality in support of an approved windshear detection and avoidance system." with: "This TSO addresses weather detection

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			totality of the TSO is focused on forward looking windshear.	Alternatively these two sentences can be removed as the information is duplicated and more appropriately located in section 3.a.(1).	and ground mapping, forward looking windshear detection, forward looking turbulence detection, and atmospheric threat awareness capabilities. It does not include flight guidance system functionality in support of an approved windshear detection and avoidance system." (See response to comment 1.)
4.	Garmin	3.b.(4) Page 3	Paragraph. 3.b.(3) includes the statement: Design the system to at least these failure condition classifications. Wording needs to change to allow failure condition to be determined at the aircraft level. This statement implies the failure condition classification of an appliance is determined by the TSO regardless of mitigations employed to meet aircraft level safety requirements such as redundant appliances/systems. Unless the DAL cannot be affected by the installation, the aircraft System Safety Assessment should determine the failure classification and by extension, the design assurance level (DAL) requirement. The aircraft FHA/SSA ultimately determines the DAL requirement for a particular installation. Specifying the DAL at the appliance level without the benefit of the specific aircraft level FHA/SSA means that in some cases the DAL will undoubtedly be higher and more costly	Suggest changing to the alternate wording identified in paragraph 3.b. of the TSO Template in Order 8150.1C Appendix G.	Not Accepted. The same failure condition classifications, except for the new function atmospheric threat awareness, have been successfully implemented in TSO-C63d. The forward looking windshear failure condition classifications described in the proposed TSO-C63e paragraph 3.a were described in paragraph 2.2.3.6 of RTCA/DO-220A. TSO authorization and type certification of weather radar have been successfully using the same failure condition classifications, except for the new function atmospheric threat awareness, as described in the proposed TSO-C63e. The failure condition classifications described in the proposed TSO-C63e paragraph 3.a are not expected to vary

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			than necessary. This will have a chilling effect on the installation of new, safety enhancing technologies since the cost will be greater than necessary. It is possible to build and certify a TSOA appliance that cannot be approved for installation in one or more aircraft types because it does not have the required DAL. Similarly, just because the appliance meets a TSO DAL does not mean it can be approved for installation. We recommend that no failure classification/DAL requirement be included in a TSO when the installation can affect or mitigate the hazard level and therefore consideration should be given to revising paragraph 3.c in this TSO to the general guidance in the Recommendation column.		with installations since weather radar functions are not dependent with other aircraft functions thus their failure condition classifications are not affected/mitigated by the installations. The proposed TSO-C63e paragraph 3.a describes the minimum requirements for the failure condition classifications, an applicant's radar failure condition classifications can exceed the specified requirements. No change made to paragraph3.b.(3).
5.	Garmin	3.f Page 4	Including this specific DO-254 reference is redundant to the rest of the paragraph in this section. For custom airborne electronic hardware determined to be simple, RTCA/DO-254, paragraph 1.6 applies. DO-254 makes it clear how to address "simple" custom airborne electronic hardware.	Remove this reference to DO-254 Paragraph 1.6.	Not Accepted. It's in the current TSO template. This template has been publicly commented and many Avionic TSO's complied with the requirement for airborne electronic hardware (AEH). RTCA/DO-254, paragraph 1.6 addresses simple custom airborne electronic hardware. So for custom airborne electronic hardware determined to be simple, RTCA/DO-254, paragraph 1.6 applies.
6.	Garmin	4.b.(2) Page 4	Paragraph 4.b.(2) states: Each subassembly of the article that you determined	The language for this requirement is confusing. This could mean that a stuffed printed circuit board needs the TSO	Not Accepted. It's in the current TSO template. This is

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			may be interchangeable. This language is confusing.	number. Suggest removing the statement or if removing causes problems, work with industry to establish wording that is better understood.	a requirement under the TSO template that has been publicly commented. The need for this statement is paramount to maintaining configuration control of any part or parts (subassembly) that can be removed and interchanged in the article. The stuffed printed circuit board can easily have the TSO number since in many cases we engrave the assembly and part number of the printed circuit board after the silkscreen is completed. We also add various software and hardware part numbers on the printed circuit boards quite commonly. The need is for configuration control and tracking and tracing any subassembly that can be removed and this should not be an issue or a burden in any way.
7.	Garmin	4.d. Page 4	Section 4.d. includes the statement: You may use electronic part marking to identify software or electronic hardware components by embedding the identification within the hardware component itself (using software) rather than marking it on the equipment nameplate. If electronic marking is used, it must be readily accessible without the use of special tools or equipment. This statement typically includes the term “airborne”	Add airborne: You may use electronic part marking to identify software or **airborne** electronic hardware components by embedding the identification within the hardware component itself (using software) rather than marking it on the equipment nameplate. If electronic marking is used, it must be readily accessible without the use of special tools or equipment.	Accepted. Made change as suggested.

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			prior to "electronic hardware" as described in Appendix G of Order 8150.1C.		
8.	Garmin	7.b. Page 8	TSO paragraph 7.b contains wording that is inconsistent with Order 8110.4C CHG 4.	TSO paragraph 7.b includes additional guidance about what furnished data should be provided to an operator or repair station when the equipment includes a non-TSO function. The problematic guidance states "include one copy of the data in paragraphs 5.f.(1) through 5.f.(4)." This guidance is inconsistent with Order 8110.4C CHG 4. Order 8110.4C CHG 4 paragraph 6-9.b.(6) defines the FAA-industry agreed data that must be provided to an installer when equipment includes a non-TSO function.	Not Accepted. It's in the current TSO template. This is part of the TSO template that has been publicly commented. It has been adopted and incorporated into many TSO's that contain Non-TSO functions. The difference between the Order 8150.1C and Order 8110.4C is that Order 8150.1C addresses only the design and production of an article with specific requirement for the MOPS of the article. The Order 8110.4C addresses the installation aspects as well. At the TSO level the information of all Non-TSO functions must be provided so that the installer can use that information to comply with the airworthiness regulation of the product that he/she is installing the article on. This is consistent with the certification process that is currently in place.